Volodymyr Parsyak
Intellectual Digital Economy Department,
Admiral Makarov National University of Shipbuilding, Mykolaiv, Ukraine
E-mail: volodymyr.parsyak@nuos.edu.ua
ORCID: https://orcid.org/0000-0002-4756-8977
Researcher ID: V-8329-2017

Olesia Kanash
Department of Intelligent Digital Economy,
Admiral Makarov National University of Shipbuilding, Mykolaiv, Ukraine (corresponding author)
E-mail: olesia.mandra@nuos.edu.ua
ORCID: https://orcid.org/0000-0002-9586-0964
ResearcherID: ISA-3679-2023

Olena Zhukova
Department of Intelligent Digital Economy,
Admiral Makarov National University of Shipbuilding, Mykolaiv, Ukraine
E-mail: olena.zhukova@nuos.edu.ua
ORCID: https://orcid.org/0000-0001-8966-8354
ResearcherID: ITB-6225-2023

Reengineering the Educational Process in Higher Education Institutions on a Dual Basis

Abstract

The *purpose* of the paper is to present the authors' conclusions and practical recommendations regarding the restructuring of the educational process of higher education institutions – providers of educational services in partnership with specialised companies. *Methodology*. The following methods were used: structural-functional method – in the study of the internal structure of the educational process, based on the principles of duality, where each component has a corresponding purpose in the value chain of intellectual capital; graphical modelling – to systematically reflect the author's views on relevant aspects of the research. *Results*. The sequence of the reengineering cycle and the directions it should take have been defined. It is emphasised that reengineering includes the competences acquired by the recipients of educational services, their communication with teachers, curators from the company, teaching methods and technologies that make up the instrumental mix, the structure of which depends on the mix of expected professional competences. *Practical implications*. It is emphasised that an applicant should have the right to make an independent choice between the forms of education, taking into account his/her economic circumstances and plans for future professional life in a democratic country. For each of the options, guidelines are proposed for completing the standard number of classroom hours, independent work and other forms of academic activity.

Keywords

economy, business, education, higher education, dual higher education, educational process, reengineering

JEL: D24, I23, I25, I25, J23, M53, O15

DOI: https://doi.org/10.30525/2500-946X/2024-1-7

1 Introduction

It is quite common for some people in administrative positions (from ministerial to university) to have a particular perception of life's realities. This can be described by the formula: "enthusiasm – an attempt to transfer it to the space of subordination – loss of interest and decline of initiative". This formula describes the events surrounding the introduction of the dual form of higher education in Ukraine. In 2018, the Cabinet of Ministers approved the "Concept of Training Specialists in the Dual Form of Education" (The Order of the Cabinet of Ministers of Ukraine "On Approval of the Concept of Training Specialists in the Dual Form of Education", 2018). The following year, the academic community got acquainted with the Action Plan for the implementation of the Concept (The Order of the Cabinet of Ministers of Ukraine "On Approval of the Action Plan for the Implementation of the Concept of Training Specialists in the Dual Form of Education", 2019).

Then the Ministry of Education and Science took up the baton: creating a working group, implementing a pilot project, and developing bylaws (The Order of the Ministry of Education and Science of Ukraine "On Approval of the Regulation on the Dual Form of Professional Higher and Higher Education", 2023).

They are followed by the heads of higher education institutions, academic councils, and education departments with decisions, orders, and directives. Typical bureaucratic red tape with the appropriate scientific and popular support (Azhazha, 2019; Khomyshyn, 2020; Yaroshenko, 2023). The advantages and risks of its implementation are discussed by Dovhenko Ya., Yaremenko L. & Yaremenko Yu. (Dovhenko et al., 2021). All of this is instead of summarising at least the interim results of the process. Only rarely have the economic aspects of dual education been covered in in-depth publications in professional journals (Synchak et al., 2022).

After analysing the available facts, trends in the development of the higher education system in Ukraine and countries with developed, innovative economies, as well as the positions and expectations of stakeholders, their personal and professional interests, the following conclusion was drawn: implementation of ambitious plans to introduce dual forms of professional competence acquisition in higher education requires revision of such constants as technologies and design of economic relations in the system "student-higher education institution-organisation", use of academic space, teacher workload, student study and leisure schedules, and class schedules.

Fragmentary improvements and individual compromises, typical of previous studies, are not enough. The need for a radical reengineering of the educational process has been proven. It is so urgent that this study is devoted to presenting relevant proposals and recommendations.

The *purpose of this paper* is to present the authors' conclusions and practical recommendations on restructuring the educational process in higher education institutions that demonstrate a commitment to providing students with educational services in a mutually beneficial partnership with the relevant business.

2 Specifics of Educational Process Reengineering

The concept of reengineering, as traditionally understood in scientific discourse and practical management, is applied to business processes. In this context, reengineering is defined as rethinking, changing core components, functions of the organisation and other elements of activity with the aim of improving overall efficiency and its specific indicators (Hulevatyi, 2023). The reengineering cycle is shown in Figure 1.

The above diagram shows that the reengineering of any process includes three fundamental components, which are projected onto higher education:

– Technological. The use of new teaching methods based on the implementation of the dual education concept.
– Organisational. Structuring the process of dual education and describing the relationship between its subjects.
– Economic. Aligns the economic interests of participants in the dual education system.

Reengineering in higher education unfolds in three directions of its application: administrative, academic and economic. Observations have shown that administrative processes are not of key importance in the higher education system, as they serve to support academic processes. However, since the ultimate goal of education is to ensure the scientific, professional and practical training of specialists, the creation of conditions for this is no less important. Therefore, the objective of redesigning the educational process on the basis of duality principles concerns the achievement of both administrative and academic objectives. Currently, the focus is on the academic component.

In this context, the following is the definition of the educational process: a system of organisational and didactic measures aimed at implementing the content of education at a certain educational or educational qualification level. Its goal is to form an educated, harmoniously developed personality capable of constantly modernising scientific knowledge, demonstrating examples of professional mobility, and quickly adapting to changes and developments in technology, management systems, labour organisation, and the socio-cultural sphere. Based on the above definition, the following conclusions can be drawn:

– Higher education institutions have the right to use all available means to ensure that graduates acquire at least the specified competences.

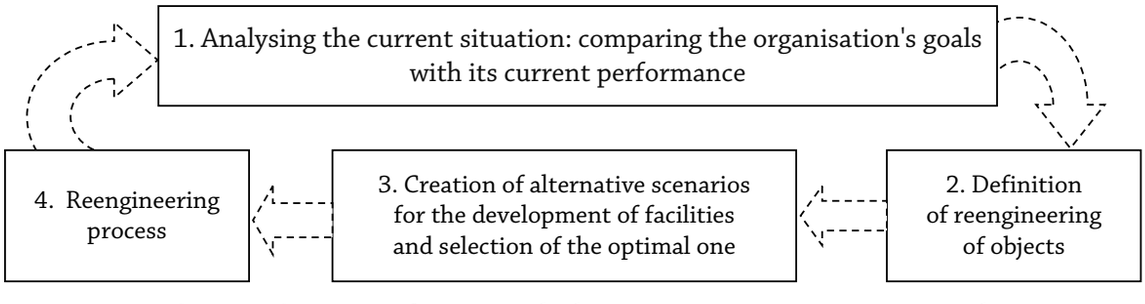

FIGURE 1. Sequence of stages in the business process reengineering cycle
Source: authors' own development

– The starting point for developing the learning process is the creation of a curriculum and a corresponding class schedule. The structure of the curriculum in the form of a graphical model is shown in Figure 2.

The curriculum reflects information on the specialisation, level of education, qualification, standard duration of study, schedule of the educational process, compulsory and optional components, theoretical and practical training. The educational programme includes a compulsory component (not exceeding 75% of the curriculum) and an optional component (comprising at least 25% of the curriculum). The number of hours of full-time educational activities ranges from 33% to 50% for junior specialist's and bachelor's degrees, and from 25% to 33% for master's degrees. The duration of distance learning should not exceed 20% of the volume of full-time educational activities.

The schedule of the educational process determines the calendar terms for theoretical and practical training and other components of the educational programme. As for the full-time form of education, it has the following features: the academic year consists of two semesters. Theoretical training, work placements and exams take 40-44 weeks. At the same time, 15 weeks per semester are allocated to theory acquisition; practical training is separate from theoretical training and lasts no less than six weeks.

The authors believe that in a democratic country, future students should have the right to choose their own form of education based on their life circumstances and future plans. It is important that this choice is conscious, and not based solely on the recommendations of reference groups – parents, friends, acquaintances, and even more so – members of the admissions committees of educational institutions. It would be more productive if they explained to prospective students the content of dual education and the economic prospects it offers them during career guidance activities.

The reasons for the interest of consumers of educational services in the introduction of acceptable innovative technologies in higher education institutions can be outlined as follows:

– Combination of work at an enterprise under a contract with studying at a higher education institution under an educational and professional programme. This strengthens professional competences that are important for a person to maintain their current position or achieve career ambitions.
– Combination of university studies with the acquisition of practical skills during flexible work at an enterprise with further guaranteed employment.
– Acquisition of professional competences in an educational institution in the chosen speciality in combination with an internship provided for in the curriculum.
– There are also cases when a student does not support dual education and prefers the classical form. It is obvious that a future philosopher or astrophysicist, for example, will have less need for dual education than a design engineer, IT specialist or economist.

Each of the paths requires the coordination of the applicant's plans with the peculiarities of the academic schedule throughout the entire study. In view of the above, the working hypothesis on reengineering is being investigated:

Its derivative educational component is the professional competences acquired by the recipient of educational services;

– communication between the instructor (a supervisor from the company where students learn

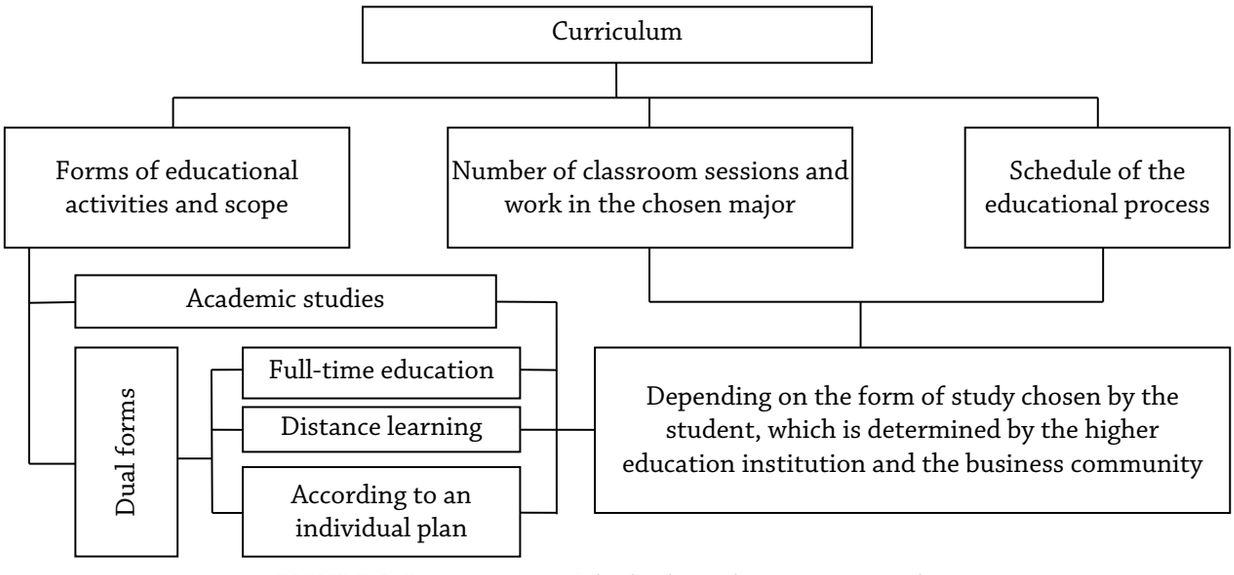

FIGURE 2 Components of the higher education curriculum

Source: authors' own development

practical skills) varies depending on the competence being developed;
- teaching methods and technologies together form an instrumental mix that is not standardised and should change depending on the competences being developed. From this assumption, it follows that the administration of dual education and its academic support will require a change in the mindset of the participants in the educational process and their willingness to care even more about increasing their productivity for the common good;
- the tools should be scalable depending on the economic environment in which the production component of the educational process takes place. This also applies to the size of the enterprise (small, medium or large), as it affects the resources available to the management to solve the relevant tasks.

The considerations outlined above form the basis of the developed algorithm of sequential steps taken by the student in selecting an appropriate form of education (Figure 3). It is important to recognise that reengineering will inevitably be based on traditional forms of teaching – a combination of lectures and practical components. However, there must be an extended variability in their combination in terms of duration and sequence within the form of duality chosen by the applicant. The response to this challenge was to propose timetables for each of the four dual education strategies. The dual form of education that corresponds to strategies two, three or four undoubtedly requires more time for the practical component, which necessitates a revision of the curriculum.

3 Block-Modular System for Building the Educational Process

Higher education institutions have the right to change the duration of semesters and theoretical classes in the case of training and industrial practices with a break from academic studies at the request of the customer, for example, under agreements on double degree programmes. According to the authors, the introduction of a dual form of education may become such a prerequisite. This requires not formal changes but a thorough reengineering of the educational process. The solution to this task is facilitated by developing the educational process using a block-modular system. Successful experience with modular technologies dates back to the second half of the 20th century. In particular, recommendations made at a UNESCO conference in Paris in 1974 stated that modularity allows the creation of open and flexible structures in education and training, capable of adapting to changing needs in production and science (United Nations Educational, Scientific and Cultural Organization, 1974).

A distinctive feature of modular learning is the ability to create the most favourable conditions for personal growth, acquisition of the necessary knowledge and professional competences by varying the content of the curriculum, taking into account the individual characteristics and level of basic training of the applicant by reengineering the educational process with an individual approach to his or her needs.

4 Strategies for Acquiring Higher Education Based on Duality

On this basis, the goal was to offer students the opportunity to complete the required number of classroom hours, independent work and other forms of study and research, which would ultimately lead to the accumulation of relevant credits, based on consciously chosen dual strategies for acquiring professional competences. As it turned out, they have a lot to choose from.

The essence of Strategy 2 is to combine continuous work at an enterprise with studying at a higher education institution under a relevant educational and professional programme that deepens the professional competences already acquired and provides guarantees of continuing the employment contract with the employer. At the same time, variations in the form of study are offered depending on the student's schedule. Given that the student should be constantly involved in the workplace of his or her choice, the main types of educational activities, such as lectures, practical (laboratory) classes and independent work, should be conducted in a remote asynchronous mode (Figure 4).

A distinctive feature of distance asynchronous learning is its more independent nature, as the interaction between participants in the learning process takes place with a certain time delay. The student-employee will be at his or her workplace during the day, so the teacher understands this and is prepared for the fact that his or her student will not always be able to participate in offline or even online classes.

It depends on the nature of the production and the employer's attitude to the employee's needs. Therefore, in their free time, when they are not busy with work and are able to focus on learning, students will engage in the learning process using special interactive platforms, social networks and direct electronic communication with educators.

It seems that a few years ago such a proposal might have outraged the teaching staff of any university, as it requires a thorough preparation of lecture and practical material suitable for online use. However, the experience of learning during the COVID-19 pandemic, and then during the war, has given a strong impetus to the creation of online courses, video and audio recordings of lectures, teaching how to communicate with process participants at a distance of

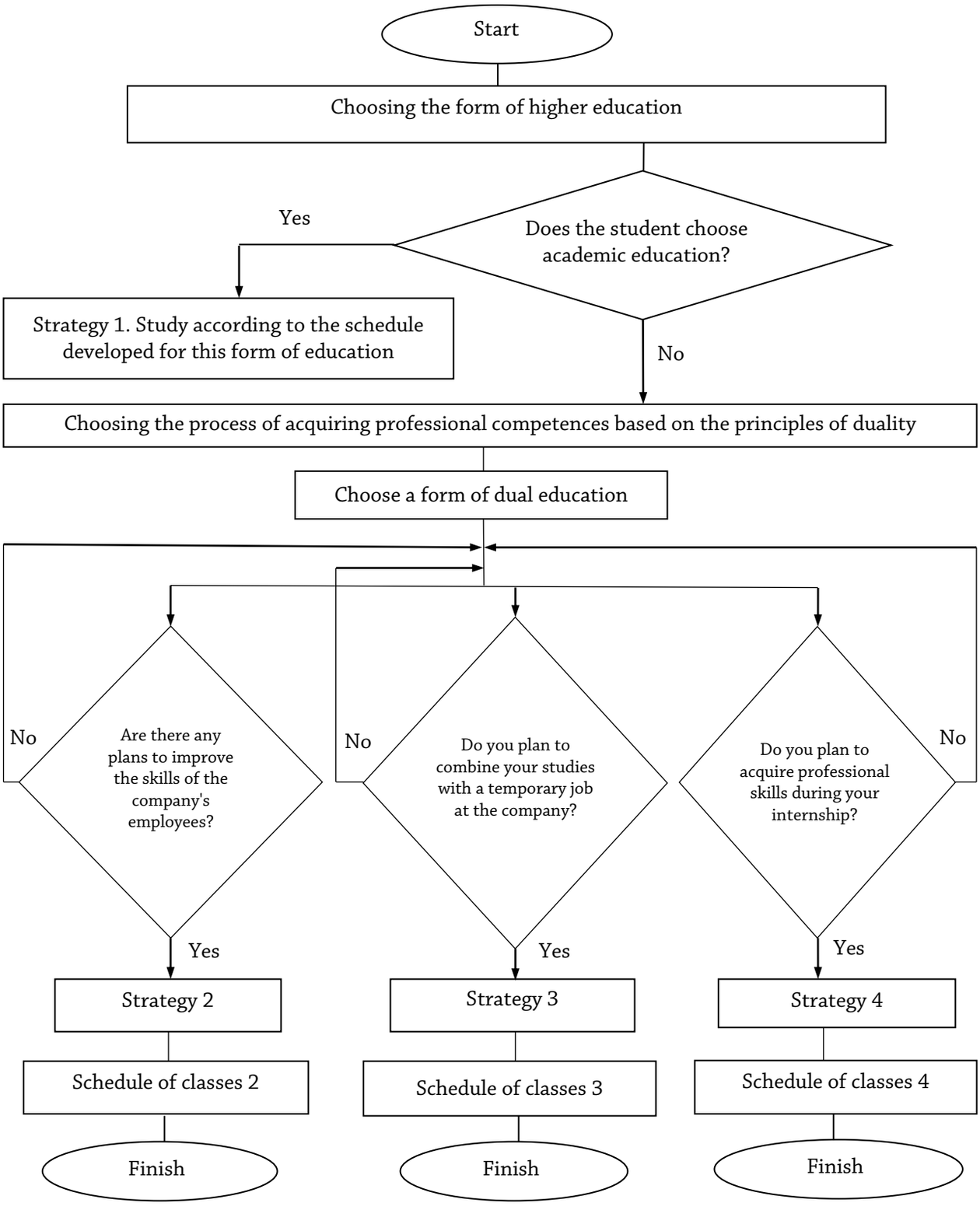

FIGURE 3 Algorithm for choosing the form of study for an applicant

Source: authors' own development

thousands of kilometres. Moreover, the Internet space offers powerful tools for such communication: Google Classroom, Moodle, Edmodo, Classdojo.

An inherent advantage of the asynchronous mode is the ability to learn the material at one's own pace of understanding. Obviously, this requires considerable self-discipline and time management skills. However, the authors are guided by the belief that students are very interested in obtaining the necessary professional competences provided by the chosen educational

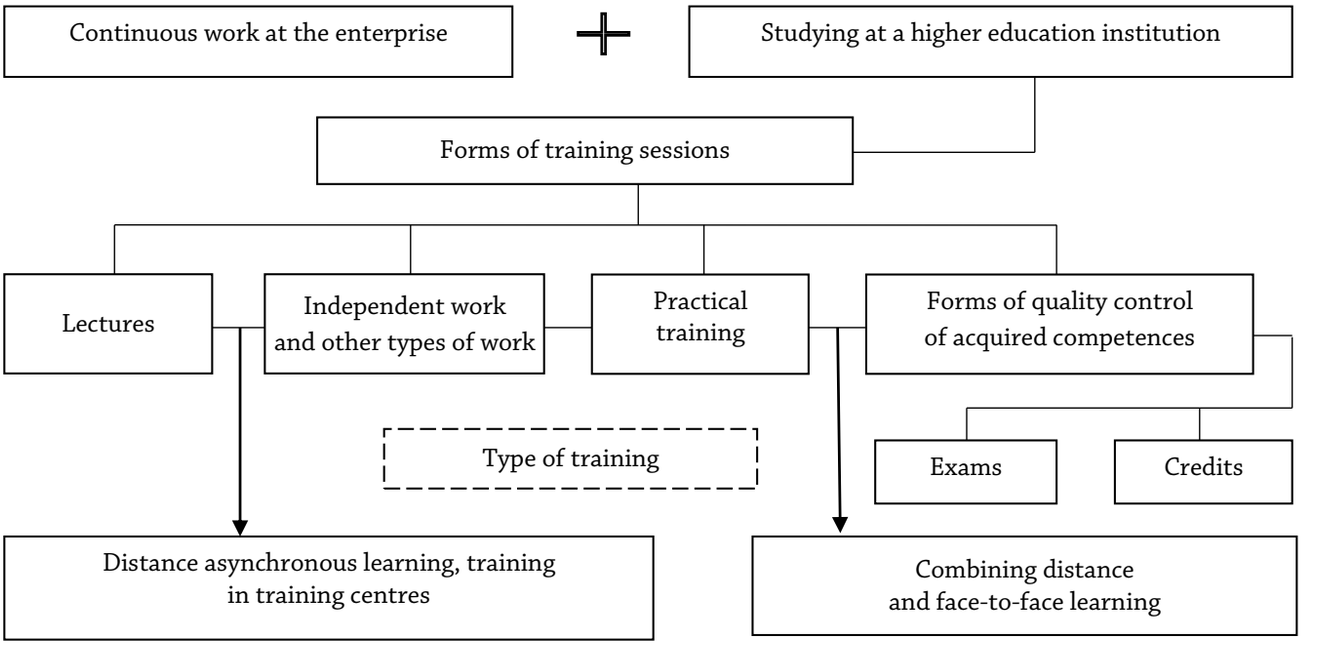

FIGURE 4 Strategy for combining work at an enterprise with studying at a higher education institution
Source: authors' own development

programme and curriculum. It is worth noting that the ideal option for lectures is to participate in online sessions in real time, provided that the student can join them without disrupting their work discipline. Moreover, this will not create any problems for the teacher either during remote sessions or during face-to-face classes using a webcam or other similar device that almost every modern person has. All that is required is to use a video conferencing software (e.g., Zoom, Microsoft Teams), send an invitation to the session participants and save the recording for future use, available to students.

Strategy 3 involves combining the educational services provided by a higher education institution with the acquisition of practical skills during temporary work at an enterprise with subsequent guaranteed employment. The scheme of this strategy is shown in Figure 5.

According to this strategy, the academic component is the main priority for a student who is primarily interested in obtaining a solid education as a basis for future professional responsibilities. The best option at the initial stages is as follows:

– Full-time study at a university with further participation in a training centre (TC). Training will take place according to an individual schedule, and the format will be agreed by the parties in a trilateral agreement;
– split working week. A few days a week, students attend classrooms, and the rest of the time they spend at the training centre (TC) or working at an enterprise;
– a combined model that blends the above options.

Studying in this mode will prepare a student of the appropriate educational level for the future combination of study and part-time work at an enterprise. It is considered useful to allow those who choose this strategy to take advantage of distance learning, taking into account situations where the involvement of students in their workplace or in a training centre will require them to perform their job duties during the working day. This time will coincide with classes at the university according to the schedule. The time when the student is ready to start working will be determined by the representatives of the TC, including the management of the enterprise participating in the dual education programme.

Finally, Strategy 4 envisages supplementing the academic component of the educational process with internships as part of the curriculum, albeit with certain reservations. For example, the working curriculum for the bachelor's degree major 051 "Economics" provides for one four-week internship in the third year of study. Such a meagre amount of practical training undermines the principles of duality. According to observations and surveys of students, it should be much greater. Especially given that some bachelor's degree graduates are employed without a master's degree. Given this observation, this paper proposes two options for increasing the number of internships:

– Reduced time for independent work to gain practical experience;
– provision of tasks prepared by company employees for students to complete remotely outside of school hours. This option is especially attractive

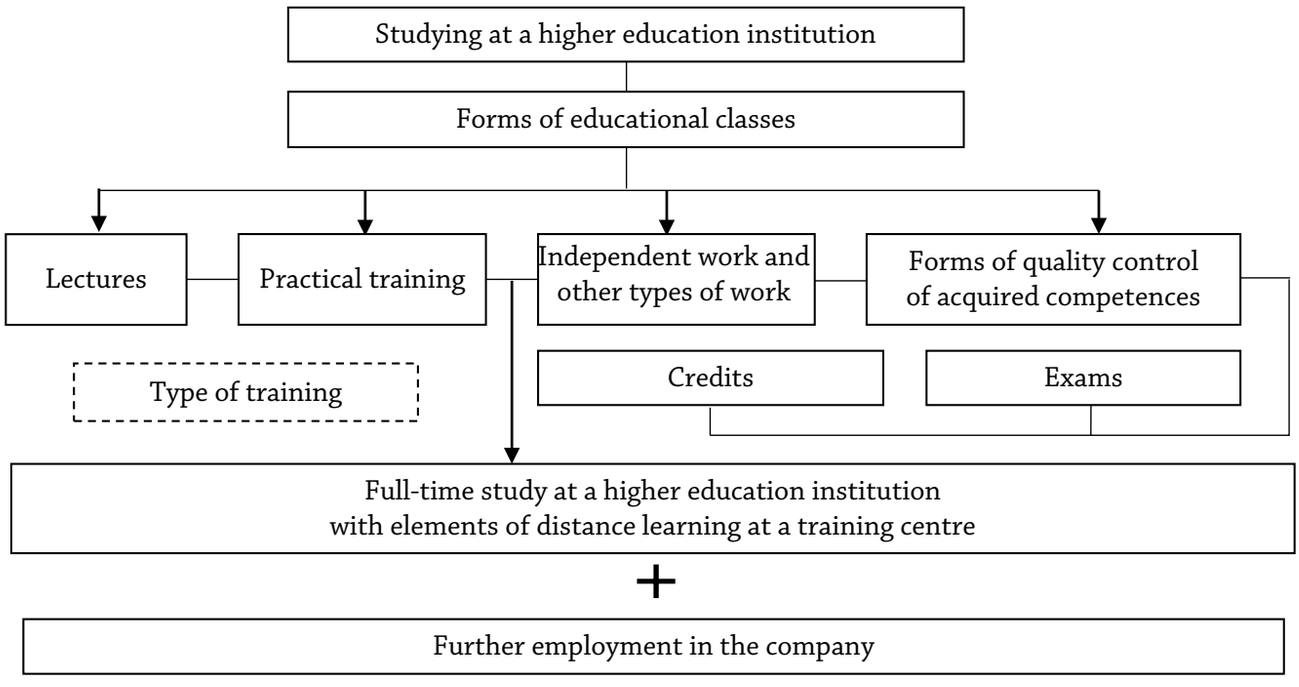

FIGURE 5 Strategy of combining higher education with practical skills acquisition at the enterprise
Source: authors' own development

for small businesses, as they will be able to assess students' talents without spending time and money on creating a workspace, and, having established a rating, select the best candidate for a vacant position.

Regardless of which of the strategies proposed by the study will be discussed, the issue of precise coordination of economic interests between the parties in the system of "customer-provider-recipient" of educational services is open for further research.

6 Conclusions

The dual system is not mechanically imposed on existing forms of education. Attempts to do so, as observed in some educational institutions, have not only failed, but also discredited the very concept of dualisation. This purely bureaucratic approach may impress state control bodies and officials, who demand reports from rectors on "completed work", the number of contracts concluded with companies, fake feedback on unrealistically positive results of cooperation. As for the students, not only do they not feel secure on the labour market after receiving their diplomas, but they are also unable to answer the question of whether they are familiar with the concept of "dual education".

It has been proved that the current educational process, its content and form do not meet the requirements for effective use of dual forms of professional competences acquired by the recipients of educational services. For this reason, attempts to integrate them into the current system not only fail, but are also fragmented. In order to overcome this drawback, a concept and a procedure for redesigning the educational process have been proposed. Its characteristic feature is the use of modular block technology, which allows prospective students to choose strategies that are acceptable to them, in line with their desire to grasp the educational content of relevant educational-professional programmes.

References

[1] Azhazha, M. A. (2019). The managing the process for the implementation of dual education in professional preparation of future specialists. *Public Administration and Customs Administration*, no. 1 (20), pp. 14–24.
[2] Dovhenko, Ya., Yaremenko, L., & Yaremenko, Yu. (2021). Vanalysis of the introduction of dual education in a higher education institution: benefits and risks. *Economy and Society*, no. 28. DOI: https://doi.org/10.32782/2524-0072/2021-28-29 [in Ukrainian]
[3] Hulevatyi, A., & Shevchuk, A. (2023). He role of information technologies in business process reengineering. *Problems of modern transformations. Series: economics and management*, no. 8. DOI: https://doi.org/10.54929/2786-5738-2023-8-04-05

[4] Khomyshyn, I. (2020). Introduction of dual form of education in Ukrainian higher education. *Bulletin of Lviv Polytechnic National University. Series: Legal Sciences*, vol. 7, no. 1, pp. 120–126.
[5] The Order of the Cabinet of Ministers of Ukraine "On Approval of the Concept of Training Specialists in the Dual Form of Education" of 19.09.2018 No. 660-p (2018). E-source: https://zakon.rada.gov.ua/laws/show/660-2018-%D1%80#Text
[6] The Order of the Cabinet of Ministers of Ukraine "On Approval of the Action Plan for the Implementation of the Concept of Training Specialists in the Dual Form of Education" No. 214-p of 03.04.2019. (2019). E-source: https://zakon.rada.gov.ua/laws/show/214-2019-%D1%80#Text
[7] The Order of the Ministry of Education and Science of Ukraine "On Approval of the Regulation on the Dual Form of Professional Higher and Higher Education" of 13.04.2023. E-source: https://zakon.rada.gov.ua/laws/show/z0929-23#Text
[8] Synchak, V., & Hrekhova, O. (2020). Financial Aspects of the Dual Form of Education. *Universytetski Naukovi Zapysky*, vol. 19, no. 2 (74), pp. 103–122.
[9] United Nations Educational, Scientific and Cultural Organization. (1974) Records of the General Conference Eighteenth Session Paris, 17.10-23.11 1974. E-source: https://unesdoc.unesco.org/ark:/48223/pf0000234156
[10] Yaroshenko, O. (2023). A Dual Form of Acquiring Higher Education as a Way to meet Labor Market Requirements for the Practical Training of Graduates. *Problems of Education*, no. 1 (98), pp. 62–77.

Received on: 11th of February, 2024
Accepted on: 26th of March, 2024
Published on: 12th of April, 2024